

CANOLA AND PULSE DISEASES

The Centre for Crop and Disease Management (CCDM), a co-investment by the Grains Research and Development Corporation (GRDC) and Curtin University, is a leading research centre committed to reducing the economic impact of crop disease in the Australian grains industry.

Our CCDM canola and pulse researchers are at the forefront of investigations into the cause and impact of two crippling fungal diseases – sclerotinia stem rot (SSR) and ascochyta blight (AB). Our research is delivering advances to industry with on-the-ground impact.

We've identified sources of genetic resistance to canola and pulse diseases

- > Through global and national collaborations we've successfully identified partial SSR resistance in canola and AB resistance in chickpeas and lentils. Ongoing research is aimed at helping breeders develop more resistant canola and pulse varieties.



We're developing management tools to improve crop yield

- > We're developing a new disease rating for sclerotinia resistance in canola and investigating the impact of fungicide use to help create management strategies that will provide invaluable advice to growers.



We've identified the first virulence gene of *Ascochyta lentis*

- > We've discovered a virulence gene that causes AB in lentils, which can distinguish two different pathotypes of this disease. Ongoing research is aimed at helping develop more resistant lentil varieties and better management strategies for growers and breeders.



Information about our key research projects over page



"Through global and national collaborations we're helping develop high-yielding, disease resistant varieties, as well as crop management strategies, to help build grower confidence and uptake."

Dr Lars Kamphuis,
Theme Leader, Canola and Pulse Diseases

Benefits for Growers, Agronomists, Breeders, Life Science Companies and Researchers

Cost effective disease management

Through the adoption of disease resistance ratings and fungicide use packages for new varieties.

Better disease monitoring

Annual monitoring, evaluation and reporting on changes in the AB and SSR pathogen virulence/aggressiveness. National population structure of SSR described, published and reported.

Linking with breeders

Delivering effector-driven breeding strategies and new sources of genetic resistance into breeding programs to develop improved, high-yielding, disease-resistant canola and pulse varieties.

Improved research tools and outcomes

Access to proven and robust phenotyping methodology, world-leading expertise on pathogen/plant interactions, and resistance tools/knowledge.



UNDER THE MICROSCOPE:
Using a green-fluorescent protein-labelled *Ascochyta lentis* pathogen our researchers are able to highlight the proliferation of the fungus on a susceptible lentil plant.



CCDM researchers Mark Derbyshire and Toby Newman investigating sclerotinia stem rot in canola.

GREATER UPTAKE OF CANOLA AND PULSES into the Australian grains industry is a key goal for our CCDM research.

We're working on research solutions to protect these crops from destructive fungal diseases and help build their yield and profitability.

At the CCDM we have four projects targeting key canola and pulse diseases:

1. Agronomy and management solutions to sclerotinia stem rot (SSR) of canola and pulses

AIM: Create agronomy and management solutions to combat SSR in canola and pulses. Development and rollout of a disease resistance rating system to help growers more cost-effectively manage SSR in the field.

2. Genetic solutions to sclerotinia stem rot (SSR) of canola and pulses

AIM: Building on our discovery of partial SSR resistance and linking with breeders to incorporate findings into breeding programs to help develop Australian varieties with greater disease resistance. Expanding global collaborations.

3. Ascochyta blight (AB) of pulses with a focus on chickpea

AIM: Improve monitoring, characterisation and surveillance of pathotypes for better crop rotation planning to expand the grower base and deliver pre-breeding lines with greater AB resistance.

4. Ascochyta blight (AB) of pulses with a focus on lentils

AIM: Deliver pre-breeding material with strong resistance to AB, develop key research tools for effector characterisation and provide growers with advice on disease dynamics in the field.

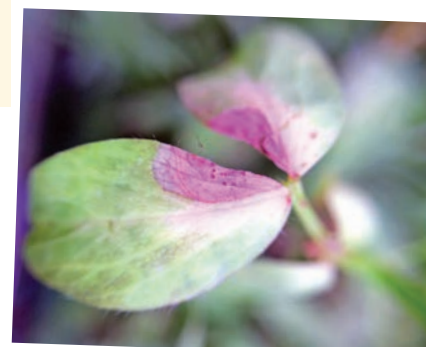
CASE STUDY: Putting the pulse back into chickpeas – how a 'wild' idea could revamp a one-time favourite



By crossing wild chickpea genotypes with elite Australian varieties CCDM is working to expand the genetic diversity of the crop in Australia and provide new genetic markers to breeders.

Through lab and field based trials we are working to improve genetic sources to expand the crop's diversity and improve the viability of chickpeas as an appealing Australian crop.

Over 60,000 plants were trialled by our team at three sites across Australia in 2019, with 450 lines selected for further testing for adaptation on a variety of soil types across 2020.



Want to know more?

Our team is happy to answer your canola and pulse disease questions and we encourage you to get in touch:

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